

Name:

Solutions

Directions: Please answer all questions **WITHOUT A CALCULATOR**

1. Simplify  $27^{\frac{1}{3}} = 3$

2. Simplify  $16^{\frac{3}{4}} = (16^{\frac{1}{4}})^3 = (2)^3 = 8$

3. Simplify & write the answer without any negative exponents  $\frac{39y^3}{13y^8} = \frac{3}{y^5}$

4. Simplify & write the answer without any negative exponents  $\frac{x^{-1}}{x^{-3}} = x^{-1} \cdot x^3 = x^2$

5. Simplify  $(4xy^2)^3 = 4^3 x^3 y^6 = 64x^3y^6$

6. Simplify  $8x^4y^3 + x^4y^3 = 9x^4y^3$

7. Multiply & Simplify  $(x+4)(x-4) = x^2 - 4x + 4x - 16 = x^2 - 16$

8. Square the binomial & Simplify  $(2x+5)^2$

$$(2x+5)(2x+5) = 4x^2 + 10x + 10x + 25 \\ = 4x^2 + 20x + 25$$

9. Multiply & Simplify  $(2x+7)(3x-4) = 6x^2 - 8x + 21x - 28 \\ = 6x^2 + 13x - 28$

10. Factor  $3x^2 - 11x - 4 = (3x+1)(x-4)$

11. Solve  $(3x-1)(x+7)=0$

$$3x-1=0 \\ 3x=1 \\ x=\frac{1}{3}$$

$$x+7=0 \\ x=-7$$

$$\left\{\frac{1}{3}, -7\right\}$$

12. Solve  $2x^2 - 12x = 0$

$$2x(x-6)=0 \\ \downarrow \quad \downarrow \\ 2x=0 \quad x-6=0 \\ x=0 \quad x=6$$

$$\{0, 6\}$$

13. Solve  $x^2 + 2x - 35 = 0$

$$(x+7)(x-5)=0 \\ \downarrow \quad \downarrow \\ x+7=0 \quad x-5=0 \\ x=-7 \quad x=5$$

$$\{-7, 5\}$$

Optional Extra Credit: Solve  $8x^2 + 14x - 15 = 0$

$$(2x+5)(4x-3)=0$$

$$\downarrow \\ 2x+5=0 \\ x=-\frac{5}{2}$$

$$\downarrow \\ 4x-3=0 \\ x=\frac{3}{4}$$

$$\left\{-\frac{5}{2}, \frac{3}{4}\right\}$$